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The Automobile

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AN ARTISTIC AUTOMOBILE DELIVERY WAGON.

An Artistic Automobile Delivery Wagon.

The front page illustration this month shows what can be done in an artistic sense with the automobile delivery wagon. The vehicle in question is one of two recently built for Fleischman & Co., the well-known New York florists, and in richness of design and finish it is easily in the front rank of its class.

The body of the wagon is painted a rich violet, with green striping, and the running gear is also green, picked out with a darker shade of the same color. The combination of colors is both pleasing and effective, and for a floral wagon most appropriate.

The wood carving is all hand work, and the windows are thick beveled edge plate glass. The interior of the wagon, which, of course, is wholly enclosed to protect the plants from the cold, is lined with polished bird's-eye maple, and this is also used to line the front and as a finish for the driver's seat. The doors, one on each side, suggest the arrangement of a brougham; and two deep boxes, rising nearly to the windows, occupy the place of seats in the brougham, and contain the crates of battery cells. There are forty-four cells, of the Gould type, in four crates, one crate being in the front box and three in the rear. Side and rear swinging panels permit of their withdrawal.

Instead of a dash, the front of the wagon is finished off with a polished brass hand-rail, with ten candle-power electric lamps in frosted globes surmounting the posts at each end. Inside are four other lamps, and two more are at the back of the driver's seat, all with frosted shades. The door-knobs are of cut glass.

The controller is under the driver's seat and gives four speeds ahead and two reverse. The motors are of 2½ h. p. each, and are flexibly suspended from the rear axle. The frame is of 3-inch channel steel, and the Wood pedestal gear dispenses with the use of reaches.

From their brief experience with them to date, Fleischman & Co. are decidedly enthusiastic over the performance of their new vehicles, and have ordered three more like them. Mr. Fleischman says that in a test he sent out a horse wagon and an electric wagon over practically equal routes, and that the electric wagon made three times as many deliveries as its competitor and got back five minutes sooner. He estimates the electric machines to cost half as much to run as a team, and declares that for general efficiency the two cannot be compared. These wagons were built by F. R. Wood & Son, New York.

The recent Prohibition candidate for governor in Indiana, G. H. Eckert, is a carriage manufacturer, and he made his canvass in an automobile.

The Rise of the Automobile in the Past Century.

The origin of the idea of a vehicle propelled by a power within itself dates back to very early times. Long before the invention of the steam engine, ingenious mechanicians in France and elsewhere had conceived the notion of employing manual power, supplied by the passengers and utilized through winches or cranks, wooden worm wheels and gears, etc.; and numerous impossible drawings of ponderous stage coaches, elaborately carved and decorated, and supposed to be propelled by two or three liveried menials at the cranks, are preserved among the historical curiosities of the art.

When the appearance of steam enabled the world to produce power at will, it was but natural that inventors should have thought of using this power to replace horses. Apparently the first steam road vehicles were built by Cugnot in France, in 1765 and 1769, and he was followed by many others with patents or actual machines, in France, England and America. The names of Symington, Trevithick, Church, Gurney and Hancock, of Seguier and the elder Bollée, are connected with this early history of the steam vehicle. None of these vehicles had any lasting success, partly because railroading crowded them from the industrial stage, partly from popular and legal opposition—notably in England—and, of course, in large measure on account of their own imperfect form. They went out of sight and had little effect on subsequent design, though it is to Bollée that the world owes the independent pivot system of mounting the steering wheels.

The real birth of modern automobilism was in 1886, when Gottlieb Daimler, to whom the four-cycle gasoline engine owes more than to any other one man, interested the wealthy carriage building firm of Panhard & Levassor in his schemes for mechanical propulsion. Daimler's first patent on motor vehicles was issued in 1887 (a motor bicycle, however, had been patented two years earlier), and in the previous year the first Benz motor vehicle patent was issued. The Daimler vehicle was a sort of 'bus with front drivers, and designed to run on rails. It had three speed changes by gearing, and was shown by Panhard & Levassor at the Universal Exposition in 1889. The early Benz vehicles had a two-cycle engine, a horizontal flywheel, and an uncommon lot of complicated mechanism, all of which features have since been abandoned.

The present Panhard system of transmission, with the motor in front, the longitudinal shaft back to the case of sliding gears, and the countershaft with a sprocket pinion at each end, dates back to 1895—if not earlier—at which time the American industry was in its swadding bands. The present Benz machine comprises a horizontal single-cylinder motor in the back part of the frame, driving a shaft from which two or more belts run to the countershaft. These two systems of gears and belt may be taken as broadly representative of the two "schools" of European practice.

Automobilism in America may be said to have begun with the race from Chicago to Waukegan, organized late in 1895 by the Chicago Times-Herald. Prior to that date there had been built various experimental vehicles and bicycles by Dudgeon, Austin, Roper, Duryea, Morris and Salom, Haynes and Apperson, Maxim and others. Steam, electricity and gasoline had been used with more or less success, and at the time the race was organized there was a marked speculative "boom" in automobiles, the most extravagant promises being made for the future of the new locomotion. No less than 84 entries were received, but the real state of the industry was shown when only seven vehicles appeared to take part, and only one—the Duryea—finished the course. As the ground was deep in snow, the result could not be called a total fiasco, but its effect was wholesome in showing how much had yet to be done.

American motor vehicle development has from the first pursued a course quite independent of that abroad, and it is only within a year or two past that French or German influence has been felt on this side of the water. In some respects this has led to costly experimenting and loss of time, while in others the result of this separate development promises to be materially better for its isolation. That the American electric vehicle is superior to those abroad is generally acknowledged. On the one hand, it has had the benefit of the unparalleled development in electrical science in this country, and on the other it is not embarrassed, like the more recent European machines, by the efforts of its builders to imitate the wholly dissimilar gasoline vehicle.

As to the gasoline vehicle itself, certain characteristic differences have grown up between the best practice here and abroad. In Europe the motor generally runs at a constant speed, with a hit-and-miss governor to control it under light load; and changes of speed in the vehicle are effected by gearing. In this country the dislike of mechanical trappings has led most constructors to the use of only two speed changes by gears, intermediate speeds being obtained by throttling. This necessitates a more powerful motor if the same average speed is to be maintained, and, owing to the fact that the compression and piston speed must frequently run below the point of best efficiency, the fuel consumption is relatively high. On the other hand, this system has the advantages of much quieter running and of being less dependent on the expertness of the driver.

The use of steam for pleasure vehicles

dates in France practically from the invention of the flash boiler by Serpollet, in 1887. In that country, however, builders have seemed unable to emancipate themselves from the traditions of "tractor" design, and there are no light steam carriages in that country. For this reason the invention by F. E. and F. O. Stanley, two years ago, of a radically new design of steam carriage, in which the skilful arrangement of parts made possible a weight but a fraction of what had before been thought attainable, made the appearance of the "Locomobile" even more an epoch-marker than Serpollet's brilliant invention.

The gasoline vehicle in England is mainly a replica of French models, that

The Daimler Six Horse-Power Delivery Wagons.

By Herbert L. Towle.

Gottlieb Daimler, the late head of the Daimler Motoren Geselischaft at Cannstatt, Germany, has been called the "Father of Automobilism;" and so far as gasoline vehicles go this was true, for, outside of the heavy steam coaches of Church, Gurney, and others in England, the first serious attempts at self-propelled vehicles in Europe were made by him. That was in the eighties, after Daimler, having collaborated with Dr. Otto in developing the compression or Otto cycle engine, had set out independently to perfect the oil or gasoline motor.

The Daimler company in Cannstatt and

FIG. 1. THE DAIMLER DELIVERY WAGON.

country's real contribution to automobilism being in the line of steam wagons for commercial use. As success or failure here is measured on a purely utilitarian basis, this must be regarded as the most difficult field of all; and, comparatively speaking, it has been but little worked. Certain leading features, however, such as the location of the boiler in front and the suspension of the motor from the frame, appear to have been generally accepted. The best form for the boiler, whether flash or water tube, is still much in debate, and the running gear exhibits wide diversity of ideas. Even with the tentative designs thus far, however, enough has been accomplished to demonstrate that in certain classes of haulage the heavy steam wagon can compete successfully with the horse; and with the entry of American engineering skill into the field the prospect seems fair for as distinctive results as have followed its application to electric, gasoline and pleasure steam vehicles.

Panhard & Levassor in Paris, without doubt the most influential builders of gasoline vehicles to-day, exchange patents and share in each other's experience; and the American Daimler company, which has begun the manufacture of delivery wagons on the Cannstatt model, is peculiarly fortunate in having the benefit of both the older concerns' experience. Three of these wagons were exhibited at the Madison Square Garden show, and the writer was kindly permitted to examine them and obtain a full description for the benefit of THE AUTOMOBILE'S readers.

In general arrangement these machines are similar to the Panhard, in that the motor is located under a bonnet in front of the dash, with the power transmitted through a conical friction clutch and longitudinal shaft to the change gear case, whence a pair of bevel gears, a countershaft, and two sprocket chains transmit to the wheels. The details, however, are quite different. The longitudinal members of the main frame are of U channel iron, rather heavy and not filled with wood. They are overhung by the body on both sides, and the motor bonnet just covers them. Between them, and a few inches lower, are two long, steel tubes, extending nearly the whole length of the frame, and hung from the channel irons at intervals by forged brackets. These tubes form the support for the motor and transmission gear case; and the detail half-tones of the motor and gear case show the capped sockets, two on each side,

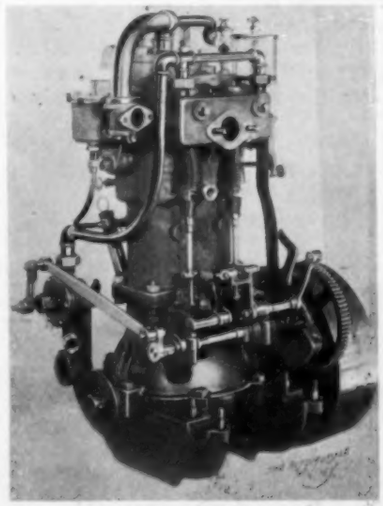

FIG. 2. THE MOTOR.

through which these tubes pass. In this manner the motor crank case itself, with the adjacent brackets supporting the tubes, forms the front transverse connection between the channel irons, while in the rear the same office is performed in part by the gear case and in part by a heavy tie bar at the extreme ends of the channels.

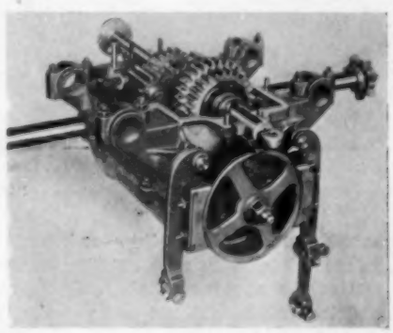

FIG. 3. THE TRANSMISSION GEAR.

As in the Panhard, the female portion of the conical friction clutch is formed in the flywheel, and the cone, which is faced with a patented composition, is carried on the end of a shaft running back to the gear case, where it is flange-coupled to the upper one of the two gear shafts. The back end of this shaft, as shown in Fig. 3, has an eye to receive a pin, and a lever, fulcrumed at the end of the left-hand supporting tube, acts to pull this and the

clutch shaft backwards, to disengage the clutch. A tension spring in the end of the right-hand tube keeps the clutch normally engaged. The gears on this shaft are splined, so that the shaft is free to slip lengthwise through them; but instead of being all on one sleeve they are joined two and two, and two hand levers are used to shift them. These levers have forward, back, and neutral positions, and control respectively the first and third end the second and fourth speeds. An interlocking device on the sector attached to the seat prevents either lever fom being moved out of its neutral position until the other has been returned thither. A short hand lever near the other two operates the reverse, which has only one short crank handle under the driver's right hand.

The countershaft, of course, contains the differential, and its outer ends find bearings in two hangers bolted to a stiff steel plate extending clear across the frame and bolted to the channel irons. Distance rods extend between these hanger bearings and the axle, and long links connect them lengthwise with the front ends of the longitudinal semi-elliptic rear springs. The rear ends of these springs are linked to a transverse spring on whose arched centre is bolted the transverse tie-bar conecting the chanel irons. Each distance rod therefore affords a direct support for the pull of the chain, and the spring links are long enough to allow of tightening the chains by lengthening the distance rods, these being provided with right and left-hand nuts for that purpose.

The front end of the frame rests on two elliptic springs, and distance rods extend from the front axle back to a transverse bar connecting the step brackets. Steering is by a wheel acting on a pinion and gear sector.

The motor is of the well-known Daimler type, with two cylinders, and has a governor which cuts out first one and then both cylinders by acting on the exhaust valves. The writer did not inquire its cylinder dimensions, but believes that 3½ × 4¾ inches would not be far wrong. The Daimler float-feed vaporizer is used, with the mouth of the dilution tube carried through the dash and provided with a slotted cap for regulation. The gasoline is carried in a 12-gallon cylinder hung below the frame, and a tube, with a relief valve set to a certain pressure, runs from the exhaust chamber to this tank. The gasoline is therefore always under a slight pressure, and this forces it up to the float cup of the vaporizer. An accelerator, acting on the governor, enables the driver to vary the motor's speed; and the lubrication of all parts is carefully looked after, holes and tubes being provided so that the oil splashed about in the crank case will find its way to the cam shaft bearings and back again.

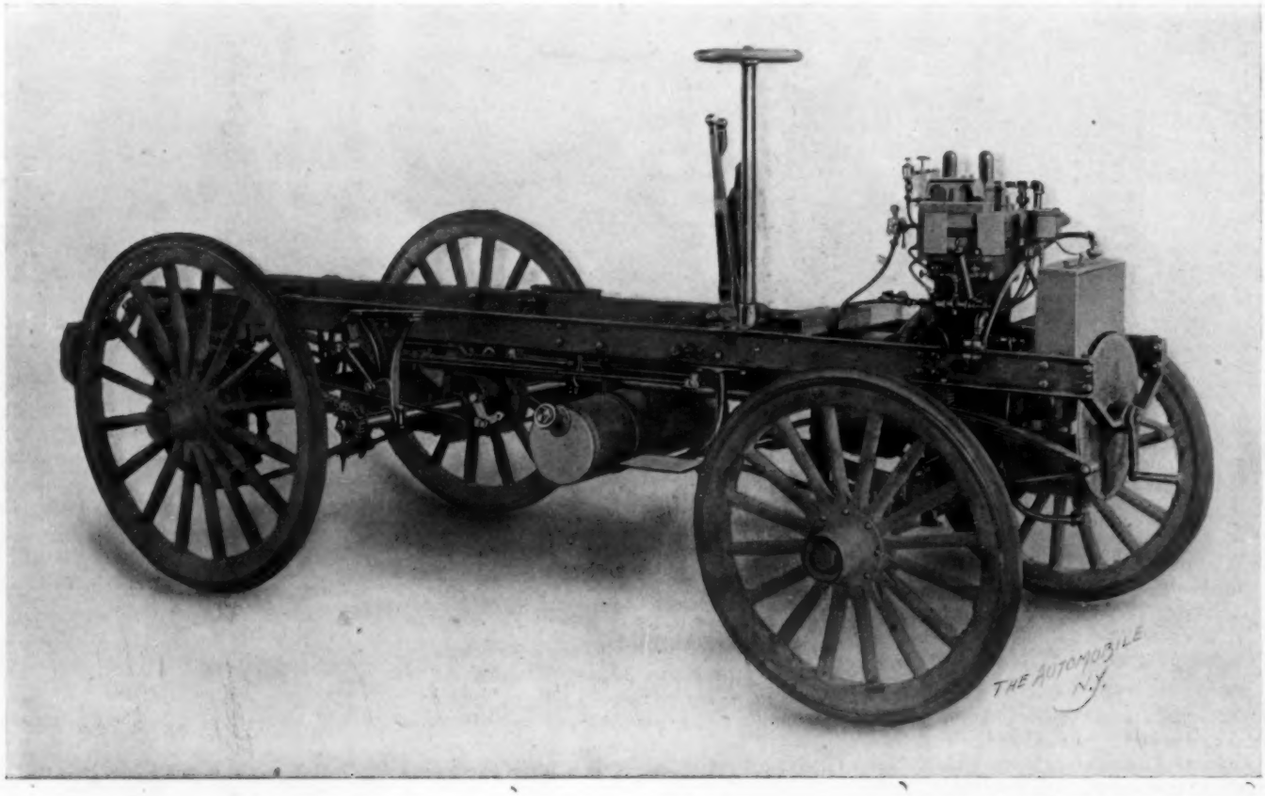

FIG. 4. THE RUNNING GEAR—DAIMLER DELIVERY WAGON.

speed, and is obtained by swinging an intermediate gear, seen in Fig. 3 at the left of the upper gear shaft, downwards and into mesh with the two gears of the first speed. The bevel gears on the intermediate and counter shafts are therefore always in mesh.

The rear end of the intermediate shaft carries the brake drum, seen in Fig. 3, and this is acted on by two wood shoes operated by a foot pedal which first disengages the clutch and by a further movement applies the brake. The same pedal is used to release the clutch for a change of speed. The emergency brakes act on the rear tires, and are operated by a steep-pitch screw whose upper end has a

The water cooler is surmounted by a small tank, the two together holding six gallons. The fan, mounted on a short shaft which carries the starting crank on a ratchet at its front end, is driven by the motor at the latter's speed, and the writer was assured that with the addition of no more than a quart the water supply would last through an average week. Forced circulation, of course, is used.

As the illustration shows, the wheels are of exceptional diameter, being 36 and 46 inches respectively, with solid rubber tires. The track width is 62 inches, and the wheel base approximately 8 ft. 2 in. It is apparent that the long wheel base renders the transmission of the power

from motor to rear axle a more difficult problem than in the Panhard pleasure vehicle, and quite probably if the same lightness of construction were used here as in the latter machine it would be impossible to maintain alignment between the motor and gear case bearings. The use of the horizontal tubes, from which the motor and gear case are hung, though it might seem pointless at first, is considered by the makers to aid materially in preserving this alignment; and it has the further advantage of allowing both to be removed bodily from the frame, without disturbing any of the bearings or dismantling the frame.

The Riker 20-Passenger Bus.

The illustration presented shows a 20-passenger electric bus, one of three built by the Riker Motor Vehicle Co., for the Union Motor Transportation Co., Wilkesbarre, Pa. They weigh about 7,500 lbs., and are rated at a running capacity of 20 miles on a charge.

THE RIKER 20-PASSENGER BUS.

The President of the Transportation Company, writing, on Dec. 11, to the makers, reported that the three machines had been in operation since Dec. 3d, making trips every fifteen minutes over a route about a mile and a half, and running fifteen hours each day. During that time they carried 4,447 passengers and aggregated over 1,800 miles running distance, missing but one trip on schedule time, which was due to abnormally heavy traffic. The substitution of the electric machines for the horse buses recently used has been followed by a marked increase in the traffic, proving again that the latter is not a fixed quantity but increases as accommodations are improved.

Touring in Horseless Carriages—A Few Suggestions.

By Mrs. F. P. Avery.

Now that touring in horseless carriages has become the fad, it will not be out of place to make a few suggestions regarding luggage. My husband and I traveled over one thousand miles in a horseless carriage last summer, and I feel sure our experience may be of some value to others. One is so apt to take unnecessary things, as we did on our first trip. Going to Newport and all the resorts on Long Island, we thought evening dress would be necessary. Only valuable space was taken up. Tourists are recognized and accepted.

We made early starts, the mornings are so beautiful for riding. At night we were too sleepy to sit up, so it did not pay to put on evening dress.

In the first place, I would strongly recommend that the tools used for the machinery of the carriage be left in the apron provided for them. A rubber bucket, lots of waste, extra water glasses, puncture repairing outfit and all extras for machinery should be carried under the footboard.

We found a dress suit case strapped to the dashboard more convenient than the usual hamper, and we added an extra large hamper on the back of the carriage. A sheet of asbestos was put under the hamper, so we had no fear of the heat affecting anything packed away. The umbrella basket strapped to the seat was found most convenient, not only for umbrellas, but for many things needed during the day, and it saved the trouble of opening other luggage.

In the dress suit case should be packed the crushable articles, such as shirts, shirt-waists, collars, cuffs, neckties, etc., together with an extra cloth skirt and slippers for the lady, and a good suit of clothes for the gentleman. Right here let me say that whatever is worn on the ride will be ruined with dust and faded by the sun. The night clothes could also be packed in the dress suit case.

In the hamper on the back of the carriage, packed in small separate bundles, should be three suits of under-clothes, socks and handkerchiefs and an extra pair of shoes for the gentleman. For the lady, three suits of gauze underwear, stockings, an extra under-skirt, and lots of handkerchiefs. In addition there should be storm coats, rubbers, a canvas bag containing toilet case and all necessary articles for the toilet, another canvas bag or case for the road maps, a small medicine case with the few drugs one is in the habit of using, and a flask. All of these packages should be marked on the outside so there will be no trouble to get at just what one wants. We found room in our hamper for a can of cylinder oil.

As I am not very tall, a foot-rest was necessary, and we had one made that could be utilized. Our own was made at a trunk store, but a home-made one will answer just as well. I carried our toilet articles in this, a flask, mending case or housewife, and a medicine case. In this way the suit case and foot-stool could be carried to our rooms when we made only night stops, and the hamper left in place.

It is well to have storm covers for the dress suit case and hamper. Our own were just pieces of black oilcloth and were carried under the seat with the other storm covers.

In wearing gauze underwear, I found the washing could be done quickly. The lady's hat should fit well on her head, and an elastic will be very useful when her husband wishes to go a mile a minute.

I do not make suggestions as to coverings for the eyes, as every person has his or her own ideas on the subject. My husband wore the mica protectors and I preferred a chiffon veil. A protection is necessary on account of insects as well as dust and sand.

Our journal was written up every evening in a small book. Each morning the maps we wanted for the day were taken out, and our trip marked out so there could be no mistake. With them are placed paper and pencil. I took charge of these, marking the miles when naphtha and water were taken, giving timely notice so we would not run out of either naphtha or water far from a town.

After breakfast my husband attended to the carriage and I to the packing and having the porter carry the luggage down, so there was no delay in starting. In this way we traveled through New England, making from forty to seventy-five miles a day. We were perfectly comfortable and enjoyed every minute.

The Gasoline Vehicle Engine.

VII.

By E. W. Roberts, M. E.

I note in the November issue of THE AUTOMOBILE a request for a rule for calculating the power of gas engines. A very simple rule for the purpose, and one which the writer has tested many times, is expressed in the following equation:

$$H = \frac{D^2 \times L \times R}{18{,}000}$$ for a four-cycle engine;

Wherein D = the diameter of the cylinder in inches;

L = the length of the stroke in inches;

R = the revolutions per minute of the crankshaft;

H = the delivered or brake horse-power of the engine.

For a two-cycle engine the formula becomes:

$$H = \frac{D^2 \times L \times R}{13{,}500}$$

Stated in words the rule is as follows:

Multiply together the square of the cylinder diameter, the length of the stroke and the speed in revs. per min.; and divide this product by 18,000 to obtain the horse-power of a four-cycle engine and by 13,500 to obtain the horse-power of a two-cycle engine.

The equation has the same numerator for gas engines of all kinds, and working on any sort of fuel. The denominator will vary according to the conditions under which the engine is working and with the fuel. The denominators are, however, those which fit the average engine of its respective class working with gasoline as a fuel.

These formulas will give the horse-power within 15 per cent for engines ranging from four to fifty horse-power and working with the usual mean effective pressures of from 60 to 70 pounds per square inch. The writer was talking to a builder of gasoline automobile engines last summer and he was informed that his standard engine would give any result between five and six brake horse-power when tested, although the engines were, so far as could be seen, identical in every respect, proving that a rule to give exact results must be flexible indeed.

It is always a good plan to select an engine with an ample margin of power. A gasoline engine is peculiar in that it cannot be overloaded like a steam engine. If by any chance an excessive load is put upon it, the engine slows down and very soon stops. This is because there is no means of increasing the mean effective pressure in a gas engine cylinder after it has reached the point where it is working with a full charge.

One of the most deceptive things to the non-technical man is the manner in which the manufacturer uses the term horse-power. Quite a few builders are listing their engines as giving so much indicated horse-power. This is often taken to mean that the engine has that amount of effective horse-power available for driving the vehicle. A gasoline engine may give five indicated horse-power and yet but three horse-power out of the five would be available for driving the automobile to which it was applied. While this ratio is an extreme and indicates a mechanical efficiency of only 60 per cent, such a low efficiency as this is occasionally found in small gasoline engines. This shows that the purchaser of a gasoline engine would do well to insist upon a guarantee of a certain brake horse-power at a specified speed of the engine. He should not be even satisfied with a guarantee that the engine will give the specified horse-power. An engine that will give five horse-power at 500 revs. per min. will give very nearly if not quite ten horse-power at 1,000 revs. per min.

A point which is quite often lost sight of by the gas engine designer, and one which the purchaser would do well to remember, is that obstructed inlet or exhaust passages cause a falling off in power. The loss of power is more apparent with an obstructed inlet passage than with an obstructed exhaust passage when considering the ratio of power lost to the amount of the obstruction. These passages should be designed not only in proportion to the diameter of the cylinder, but to the speed of the engine as well. There is no particular objection to an over-sized passage and it is therefore the best plan to design these passages with reference to the maximum speed at which the engine is to run for any considerable length of time.

The rule that is generally observed by the most experienced designers is to limit the speed of the gases in the inlet passages to 100 ft. per second and in the exhaust passages to 85 ft. per second. It is assumed for convenience that the speed in the exhaust passages is produced by the action of the piston with the gas at atmospheric pressure. Virtually, however, the pressure at the moment of exhaust is from 30 to 35 pounds per square inch, and it is for this reason that the lower limit is taken for the speed of the exhaust gases.

As an example, to illustrate the application of the above rule, say, take the case of an engine with a six-inch stroke running at a speed of 600 revs. per min. In a complete revolution the piston travels one foot, and it is therefore running at an average speed of 600 feet per minute, or ten feet per second. Therefore, in order that the speed of the gases in the inlet passages should not exceed 100 feet per second, the area of the passage should not be smaller than one-tenth that of the piston. Should the speed of the engine be increased to 1,200 revs. per min. the piston speed would be twenty feet per second and the area of the inlet should be not less than one-fifth that of the piston.

These ratios should be retained even in the valve itself whenever it is practicable to do so, and in valves operated by the suction of the piston they should be even larger. The lift of the valves, as indicated by the distance L in Fig. 16, should be at least one-quarter the diameter of the valve in order that the opening may be equal to the full area of the valve.

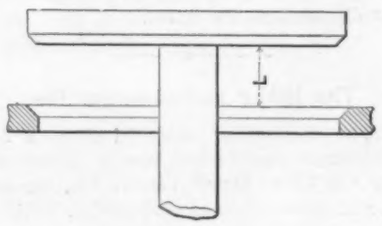

FIG. 16.

It is unfortunate but too true that the points considered in this discussion are often overlooked by the average designer. They are brought out in time by hard experience, and the writer wishes to impress their importance upon the mind of the buyer, in order that he may judge intelligently upon these important features in construction and in rating.

Consolidation of Riker and Electric Vehicle Companies.

In a financial sense, the most important event of the past month has been the consolidation under one management of the Electric Vehicle Co. and the Riker Motor Vehicle Co. The latter company's capital stock of $4,000,000 has been replaced by an issue of $1,000,000 each of common and preferred Electric Vehicle, bringing the latter company's total capitalization to $9,000,000 common and $11,000,000 preferred. It is understood that the Riker vehicles will continue to be built at the present factory in Elizabethport, N. J. All of Mr. Riker's foreign patents are included in the deal. The new governing board is as follows: President, Geo. H. Day, Hartford, Conn., vice Robert McA. Lloyd, retired; vice-presidents, A. L. Riker, H. M. Byllesby and W. H. Johnson; treasurer, Frederick Vieweg; secretary, T. W. Goodridge; directors, the president; vice-presidents, and ex-president Lloyd, P. T. Dodge, F. C. Stevens, Herbert Lloyd, Martin Maloney, A. A. Pope, T. J. Rogan, I. L. Rice, D. H. Shea, and George Chapman. Mr. Day is also president of the Electric Storage Battery Co., but it is denied that there is any business connection between the two concerns. Mr. Chapman represents John Jacob Astor, who retires from the directorate.

The Victor Steam Carriage.

This carriage, which attracted much attention at the Madison Square Garden show, is the product of the Overman Automobile Company, New York. In it the endeavor has been made to render automatic all the functions connected with the boiler feed and the air pressure, so that the operator has only the throttle, reversing, and steering levers to attend to.

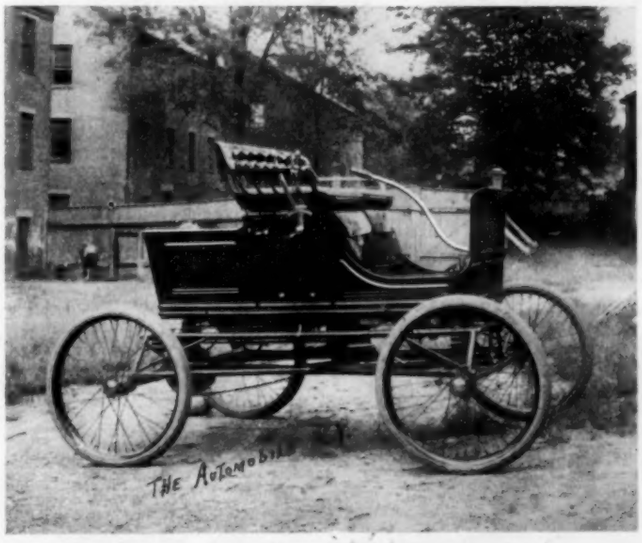

FIG. 1. THE VICTOR STEAM CARRIAGE.

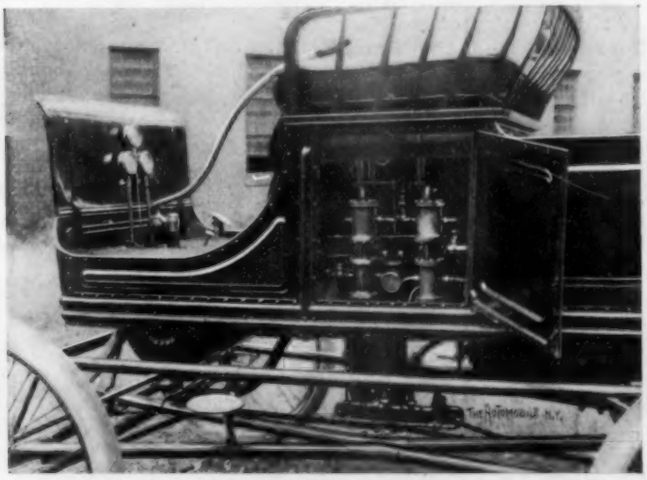

FIG. 3. THE PUMPS EXPOSED.

In addition, there are numerous auxiliary attachments for convenience in filling the tanks, etc.

The water pump is driven from the rear axle, and is virtually double, having two plungers acting alternately in opposed

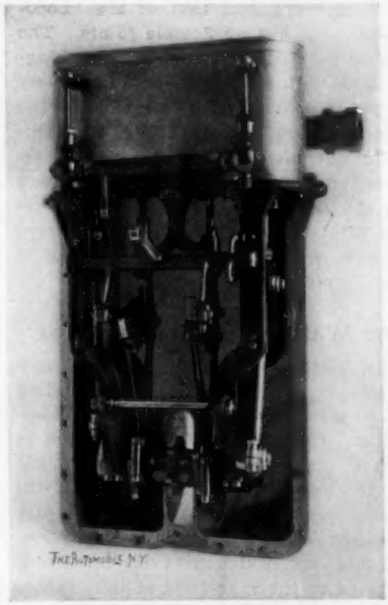

FIG. 2. THE ENGINE.

cylinders. It was the only slow-running water pump noted at the show. The by-pass valve is automatically controlled by an ingenious device placed in the rear of the body back of the tank. This operates by the varying expansion produced by steam and cold water, and is shown in Fig. 3. The U-shaped tube B is connected with the steam space of the boiler at its upper end, and with the water space at its lower end. It is placed just at the water level of the boiler, so that the upper half is normally filled with steam and the lower half with water. A water jacket C is kept cool by the water flowing from the tank to the pump, and this cools the water in B. Two strips of steel, A, are attached to the tube at their left-hand ends, while their right-hand ends afford a bearing for a tube F, which carries a short arm E. A tongue D, soldered to the tube at the bend, is connected by a pin to the end of E. When the top of the tube is filled with steam it expands slightly and rocks E a little to the right, but when the water level rises this tube becomes filled with cool water from B, and consequently it contracts and carries E a little to the left. The front end of F is connected to a spring to the by-pass valve, and the slight rocking of E (about 1-16 inch), there multiplied about four times, is sufficient to open or close the valve.

The auxiliary water pump is a miniature steam pump, and it starts automatically with an excess of steam pressure in the boiler, or it may be started by the operator independently of the steam pressure. A similar pump, controlled by a diaphram in connection with the air tank, automatically maintains the air pressure; and this likewise may be started independently by pressing a button, thus increasing the fire when desired, as when going up a long hill.

An additional feature is a fusible plug in the boiler, the melting of which admits the steam to a valve which shuts off the burner, and which can be replaced without loosening any pipe connections.

There are numerous other details to the carriage, such as the use of a coil in the muffler to heat the feed water before it enters the boiler, the discharge of the exhaust through the tubes of the frame, thereby condensing it before it escapes, the addition of a hose by which the auxiliary pump will draw fresh water into the tank, a latch to keep the throttle closed when the operator has left his seat, an indicator showing the amount of gasoline in the tank, electric lights in front of the gauges and behind the water glass, etc. The engine is encased as shown in the half-tone, and runs in oil, while the reverse lever works on a notched sector for a variable cut-off. A pilot light is used in the burner to relight the latter in case the flame becomes extinguished. The body of the carriage is made entirely of metal,

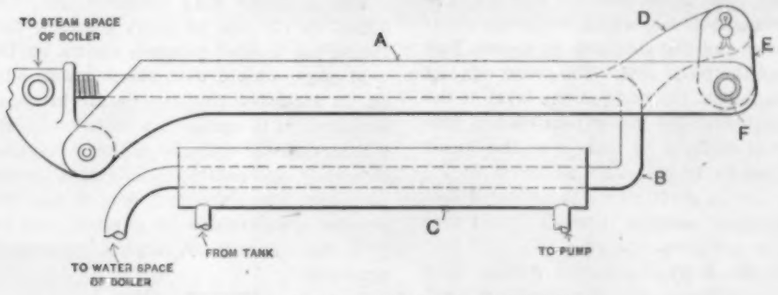

FIG. 4. THE FEED-WATER REGULATOR.

no wood being used except in the seat and footboard, thereby minimizing the ill effects of a conflagration. The brake is effective in either direction, and has a latch to hold it down when the driver's foot is off the pedal. The engine is rated at 4 h. p. The fuel tank holds 5 gallons and the water tank 15 gallons.

The carriage is interesting, and its practical operation will be closely watched.

The National Good Roads Congress.

At the meeting of the National Good Roads Association, Chicago, Nov. 19-21, a permanent organization was effected, with the business offices in Chicago. The officers elected were: President, William H. Moore, Missouri; Secretary, R. W. Richardson, Nebraska; Treasurer, Edwin A. Potter, Illinois; Vice-Presidents, California, John Baruch; Colorado, William Wadley; Washington, J. A. James; Idaho, W. E. Pierce; Wyoming, A. L. Fallows; Montana, Samuel Fortier; Minnesota, S. W. Cooley; Wisconsin, G. W. Pratt; Michigan, A. E. Palmer; Kansas, William Bradbury; Iowa, G. H. Van Hooten; Illinois, G. M. Greenbaum; Ohio, J. W. Stewart; Utah, F. J. Richardson; South Carolina, E. S. Tessler, Jr.; New York, William B. Clark; North Carolina, J. A. Holmes; Kentucky, I. B. Noll; New Jersey, General E. G. Harrison; honorary, Andrew Pattullo, M. P., and A. W. Campbell, of Canada.

The report of the committee on legislation, which was adopted, recommends:

1. That the system of "working out" road taxes be abolished, the several States substituting therefor cash payments.

2. That State legislatures provide for the use of convict labor in preparing road materials.

3. That suitable State aid laws be passed, and the appointment in connection with them of non-partisan highway commissioners.

The following committees were chosen:

Permanent Organization—H. R. Whitmore, Missouri; H. P. Rucker, New York; R. W. Richardson, Nebraska; W. F. Beatty, Illinois; James W. Abott, Colorado; J. R. Gobie, Washington, and C. R. Baker, Idaho.

Legislative—Robert Stone, Kansas; G. W. Cooley, Minnesota; J. A. Ackerson, Missouri; Andrew McNally, California; George M. Greenbaum, Illinois; R. H. Thompson, Washington, and B. F. McMillan, Wisconsin.

Addresses were made at the several meetings by men identified with the good roads movement and by road building experts, among them being Wm. H. Moore, Martin Dodge, director of the office of Public Road Inquiries at Washington; Howard W. Gross, Harrison Gray Otis, and W. B. Goit. A resolution was adopted urging the appropriation by Congress of at least $150,000 per year for the office of Public Road Inquiries.

NEW STYLES OF AUTOMOBILES

The "National" Combination Vehicle.

The illustration on the next page shows a recent product of the National Automobile and Electric Co. This is a light delivery wagon, which can be quickly converted into a break by removing the top and affixing in place of it a seat on the rear end of the battery-carrying body. The method of attaching is by slides which engage slotted tubes, bracketed to the body. Both the seat and the top have independent floors, which cover the regular body and are clamped by screws just back of the front seat. The lower edge of the top meets the body at the level of the handrail, and the passengers on the rear seat are enabled to look over the heads of those in front. The motor is of 2½ h. p., and its shaft, which is hollow, drives a split shaft passing through it and containing a differential gear. In this way one motor drives both rear wheels independently. Forty cells of battery are used, and the controller gives five forward and three backward speeds.

The "International" Gasoline Carriage.

This carriage, which was exhibited at the Madison Square Garden show, contains several special features, notably an arrangement of foot lever, ratchet and chain, by which the motor can be started from the seat. The motor is of five horsepower, with two opposed cylinders, and may be controlled by a throttle and by varying the ignition. There are three forward speeds and one reverse by gearing. There is a set of blackened radiating tubes under the sloping part of the footboard. The steering pivots of the front wheels are inclined, rendering them little affected by road shocks. The large wheels (32 and 36 inches) are an important feature of this carriage. The International Motor Carriage Co., Stamford, Conn., is the maker.

The Autocar Physician's Phaeton.

The Autocar Co., Ardmore, Pa., has added to its line of light gasoline carriages the hooded phaeton shown on the next page, which, with storm apron added, is intended for use in all kinds of weather. It is equipped with the standard 6 h. p. opposed-cylinder motor, transmission gear, and radiating coils used by this company. Two forward speeds and one reverse are obtained by gearing, and intermediate speeds by varying the time of ignition.

The Skene Steam Carriage.

The Skene American Automobile Co., Springfield, Mass., is building the steam carriage shown in the illustration opposite. It is equipped with a copper shell boiler, containing 308 copper tubes and tested to 1,000 pounds cold water pressure. The engine has steam-jacketed cast-iron cylinders and bronze frame, and is rated at 5 h. p. The burner is started without the use of a torch. The brake has two bands, one on each side of the sprocket wheel, thereby giving a center pull. Complete, but with empty tanks, the carriage weighs 450 pounds.

The Baker Electric Runabout.

The illustration on the opposite page shows the light runabout of the Baker Motor Vehicle Co., Cleveland, O., which attracted much notice at the Madison Square Garden show in November. Its leading feature is its extreme lightness, it weighing complete only 550 pounds. The frame suggests that of the "Locomobile," but has no flexible joints. The body is very narrow, the seat overhanging it on each side. Ten cells of battery are put in two trays under the seat, the back of the body being available for packages. The motor is rated as ¾ horsepower, and is geared by single reduction to a sprocket pinion. The wheels are 28-inch, front and rear. Two speeds forward and back are provided, and a radius of 20 miles is claimed.

The Waltham Steam Stanhope.

The Waltham Automobile Co., a new concern in Waltham, Mass., is building the steam carriage shown in the illustration. Its principal feature is seen in the running gear, whose reaches form the two legs of a triangle whose base is the front axle. The rear axle carries a case inclosing the brake and differential gears, and this case, which does not revolve, is swiveled to the rear ends of the reaches where they come together, so that the wheels can rise or fall independently without straining the underframe. The weight of the carriage empty is about 650 pounds, and with tanks filled 900 pounds. The gasoline tank holds 10 gallons and the water tank 28 gallons.

FIG. 1. NATIONAL COMBINATION VEHICLE.

FIG. 2. WALTHAM STEAM CARRIAGE.

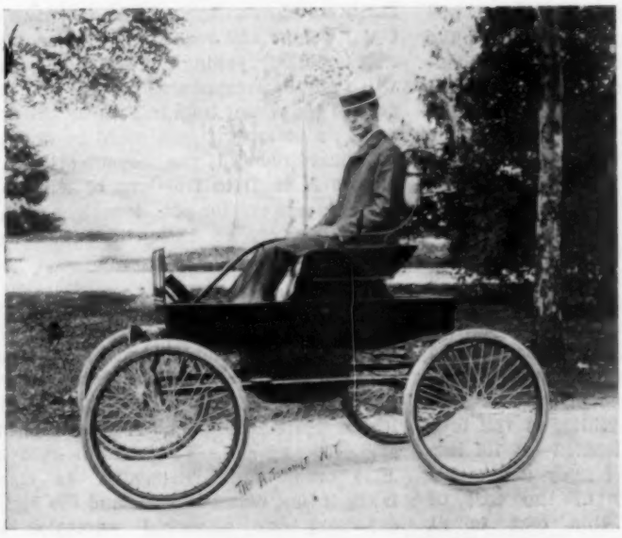

FIG. 3. BAKER ELECTRIC RUNABOUT.

FIG. 4. INTERNATIONAL GASOLINE CARRIAGE.

FIG. 5. SKENE STEAM CARRIAGE.

FIG. 6. AUTOCAR PHYSICIAN'S PHAETON.

NEW STYLES OF AUTOMOBILES.

The Automobile

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The Outlook for the New Century.

The phenomenal rise of the automobile industry, from its untried beginning fifteen years ago, is but another instance of the accumulative rapidity of scientific progress. Twenty years ago, even ten, the motor vehicle of to-day would have been impossible. Seamless tubing, the pneumatic tire, the high-pressure steam engine and the high-speed gasoline motor, aluminum alloys of bronze-like strength and toughness—all these had first to be developed. To-day the automobile is capable of double the speed of the horse in whatever class of service, it can be handled by anyone having a fair degree of mechanical intelligence, and as an instrument for recreation it has sprung into an enormous and rapidly growing popularity.

What is its future to be? Will it be known as the fad of the moneyed few, to-day the rage, to-morrow dropped for some yet more surprising novelty, or will it supplant the horse entirely with the great driving public, monopolize the haulage in the business centres, and banish the noble animal to the splendid isolation of the race track or the Zoo?

That the automobile's popularity is due partly to the novelty of the machine is evident, and there are already signs abroad that the wave has reached its crest. But its intrinsic advantages of speed and endurance will always give it the preference for touring, with those who can afford it, while in the city it has an added advantage on sanitary grounds. Granting that the very fast automobile will remain, like the yacht, a plaything of the few, the future—wide or limited—of its less patrician congener is simply a question of cost, and mainly of the cost of maintenance. What this cost is at present is a question much debated, but when we reflect how short is the time since no motor carriage could be trusted to run one mile, let alone fifty, without a stoppage, it is evidently absurd to assume that we are at the end of mechanical achievement in this regard. From the luxury of to-day is being steadily evolved the machine which, while quite possibly of high first cost, can be depended on for regular performance as much as can the traction engine or the locomotive. The public, too, is being purged of its seemingly hopeless mechanical ignorance, and the conundrum, how to make a machine which is not a machine, will ere long cease to vex the builder.

The high interest charges on the automobile are likely to leave the one-horse rig in service some time longer, and the rural districts will doubtless be late in sharing the benefits of the new locomotion. On the other hand, it seems inevitable that the commercial motor vehicle, though necessarily the last to be perfected, will ultimately displace the horse entirely in its particular field. When that auspicious end is reached it will be possible to handle more than double the present volume of traffic in the same streets, the clatter of hoofs and the pounding of iron tires on block pavements will be no more, and the street cleaning problem will have passed into limbo with the horse car nuisance and the volunteer fire company. That the next generation will be as active to bar horses from its streets as certain Dogberrys now are against the automobilist is all but demonstrated to-day.

Suggestions on Touring.

The article on touring, on another page of this issue, contains many points which will be useful to our readers when setting out on similar excursions. We shall be glad to receive similar suggestions from others who have had experience.

The French Consumption Tests.

The striking discrepancies in fuel consumption shown by vehicles of nearly equal weight and requiring, presumably, about equal propelling force at the wheels, will impress everyone who reads the report of the recent tests in France. To see what deductions, if any, could be drawn, we have reduced the consumption in classes A to D to fractions of a gallon per mile and per 100 pounds weight of the respective vehicles, thus eliminating the weight factor from the results.

Stated briefly, the consumption in class A ranges from .002 gallon per 100 lbs. per mile to .003 and .0035, the average being about .024. In class B the lowest figure is .002 and the highest .0031. In class C the lowest figure is .0025 and the two highest are .0053 and .008. Values from .0035 to .0045 occur most frequently. In class D the lowest result is .0034, and the highest—with one abnormal exception—is .0053.

In classes A and B there is no agreement between the results for machines of different makes, and very little for machines of the same make. In class C the average values occur more frequently and in class D no less than eight of the sixteen machines show figures between .004 and .0045 of a gallon. This close agreement in class D seems to show that the voiturette class in France has nearly reached a standard. At the moderate speeds imposed, there seems to have been little or no connection between the speed and the fuel consumption; a 2,000-pound machine used, on the average, about a gallon of gasoline in 20 miles, a 1,200-pound machine the same quantity in 24 miles, and a 750-pound machine a gallon in 30 miles. It is probable that if the motor power in each case were known many of the discrepancies in consumption under apparently like conditions would be explained; but even at the best there remain many which can only be laid to different efficiencies in the motor and trans-

mission gear and to greater or less skill in driving.

In comparing these results with those given by American machines, it should be remembered that the latter use throttled motors running at all sorts of speeds, so that their efficiency is necessarily lower than that of motors running at full speed and governed by cutting out explosions.

"A Mile a Minute."

The phrase "a mile a minute" appears to have become a sort of shibboleth with automobile inventors and with the daily press. Every week or two a new machine, by some previously unknown builder, is announced as nearly completed; and the remark is usually added that he expects it to go a mile a minute. The public, of course, concludes that the distance from New York to Chicago is presently to be reduced to an easy two days' jaunt; and is aggrieved, if not disgusted, when it learns the truth.

Considering how many mile-a-minute touring vehicles are within a few weeks of completion, it is somewhat remarkable how few of them are actually in commission. In fact, we cannot at this writing recall a single machine that will make anything like that speed except on a straightaway or banked track, and nobody pretends that these exceptions are fit for touring, least of all at track speeds. Extreme speeds are invariably gained at the sacrifice of safety and durability, and the day is yet distant when improvements in roads and machines will make a mile a minute anything but an extreme speed. Irresponsible chatter of this sort is mischievous where it is not ridiculous.

Fuel Consumption on Tours.

In connection with the discussion of fuel consumption in another column, some interest attaches to several reports, lately published in La France Automobile, of the fuel and oil used during extended tours.

M. Gondoin, President of the Automobile Club of Nice, in two trips aggregating 890 miles, through country "tres montageux," found the fuel and oil for an 8 h. p. Panhard to average 4 cents per mile. At 42 cents per gallon, which is about what gasoline costs in France, this would work out to about 11 miles per gallon of gasoline. On another trip of 510 miles through level country the cost was 3.42 cents per mile. The machine carried four passengers and considerable baggage.

On another trip of 900 miles, 66¼ gallons of gasoline and 2 1-10 gallons of oil were used, at a cost of 3.23 cents per mile. This works out to 13½ miles per gallon of fuel and 430 miles per gallon of oil.

Another tourist, Oscar Gregoire, reports a trip of 2,630 miles through France and Belgium. He had a Belgian machine with 6 h. p. Daimler-Phenix (Panhard) motor and carried three passengers and baggage, weighing 790 lbs. The fuel consumption was 160 gallons, or 16.4 miles per gallon, and 5½ gallons of oil were used. At 45 cents a gallon, the gasoline cost nearly 3 cents per mile.

The third traveller, with a 9 h. p. Dietrich machine, travelled 1,675 miles on a total of 141½ gallons, or 11.8 miles per gallon. The vehicle carried four passengers and baggage, the whole weighing 3,300 lbs. in order of march.

The Cost of Automobiles.

"The Book of Sports," edited by William Patten, contains an article on automobilism by Mr. Albert C. Bostwick, the well-known first vice-president of the Automobile Club of America. In this article Mr. Bostwick gives some very practical and oftentimes much needed advice to the uninitiated purchaser, who seldom appreciates, until the vehicle is actually his, its essentially mechanical character and its absolute dependence on his mind and skill. While speaking thus, however, Mr. Bostwick adds some extremely frank comparisons between the automobile and the horse as regards cost and reliability. Coming from an acknowledged leader in sporting automobilism, they are naturally of interest, and we quote the passages in question:

"It has been suggested that I mention some points gathered in my experience as a worker on and an owner and operator of automobiles, for the guidance of the inexperienced automobilist and of him who contemplates becoming an automobilist. My first word is to the latter. It is Punch's advice again, within limitations. Don't, unless you feel that you can spend time and trouble as well as money on the sport. Don't buy an automobile with the idea that it will take care of itself. It won't. Constant care is necessary if you are to get any satisfactory results. Don't, if you are a man of moderate means, deceive yourself into believing that an automobile is as easy and cheap to keep as a horse, and that you will get as much service out of it. The man who has just about enough income to permit his keeping a horse without straining his resources, and who gives up the animal in order to get an automobile, is making a mistake. Until he has thoroughly mastered his machine he will have bills for repairs that will rack him with dismay, and even after he has pretty well learned his new pet the bill at the month's end will every now and then fall on him with a dismal thud. Then, to operate a car with any degree of comfort one should have a mechanic. Now, this may strike some people like saying that a man cannot live without a valet. That is because they don't know anything about automobiles. In the first place, the machine ought to be thoroughly cleaned every time it comes in from a run. How is a business or professional man going to find time to do that? When you first get your machine it is great fun to tinker with it and correct its little eccentricities. But after a time this gets decidedly tiresome, and the chances are that the man who hasn't a mechanic will soon sell his machine because he'll find he hasn't time to keep it in condition. At present the American automobile is suited only to the man who can afford to spend time and money on it. As a source of pleasure it is not likely to take the place of the horse with the general public of the fairly prosperous classes.

"Many persons have asked me my views on the future of the automobile; whether I think it is coming to be the universal vehicle in this country. I should like to say yes; I do not say no. But at the present outlook I cannot see any immediate probability. Far-reaching improvements must be made before the automobile shall have become a practical vehicle for the general riding public. To-day its cost is too great; not only the cost of the machine itself, but the cost of its maintenance and operation. No motive power has been found that is not without important, if not vital, disadvantages. Stability and speed have not been successfully combined. There is no automobile on the American market that is even reasonably reliable for general roading. What I mean by this statement is that one cannot find a machine in which he can set out for a 25 or 50 mile ride over ordinary roads with a fair certainty that he will reach his destination on time and in good condition."

We have no doubt that Mr. Bostwick's words picture correctly the experience of a great majority of automobile users, including practically all of those who take up automobilism as a sport. Whether this majority is on that account disappointed, and even whether the condition described is inevitable, is, however, another question. In the first place, by reason of the greater power and endurance of the automobile, it is properly to be compared in cost with a span of horses, instead of with one. But beyond that is the fact of the mechanical vehicle's much higher speed. It will travel, if need be, double as fast as the horse; but the road strains to which it is subjected are proportional to at least the square of its speed, and whoever wishes simply the equivalent of a horse or pair can by merely matching their pace secure as long a life for his machine as one could wish. That machines have been run for hundreds or thousands of miles with only the most trivial stoppages or repairs is an attested fact, and it is due to the willingness of their owners to demand moderate things only of their machines.

The purchaser of a high-powered machine, on the other hand, obtains with it the possibility of zest and excitement which no horse or horses can give, and in pushing his vehicle to the limit of its capacity he cheerfully pays the higher price for the larger return. If nearly every automobile owner does this, it is simply because they prefer sport to economy and is no reflection on the automobile, but rather the contrary.

Reports appear now and then of a steam carriage running away with its occupants owing to a derangement of the throttle. The driver is usually inexperienced, and the obvious moral is that no one should undertake to handle a steam carriage till he knows of more than one way to shut off the steam. This may be done by a cautious use of the reverse lever in connection with the brake, and in addition to this most steam carriages now have an auxiliary valve which may be used as a throttle.

Hints on Steam Vehicle Management.—IV.

By George T. Hanchett.

It is a fact that one automobilist can make the same mileage as another in the same time and with a very much reduced expenditure of gasoline and water. The difference is, of course, a matter of cents per trip, but it should be remembered that it ought to be thought a misfortune to be obliged to take on water of an uncertain quality, and that the life of the boiler is most accurately measured in the total number of pounds of water evaporated by it, and similarly the wear and tear on the engine is in a degree proportional to the number of pounds of steam passing through it. In the light of this it will be seen that it is highly advisable to economize for other reasons than the mere cost of gasoline. As an additional advantage, a well-managed vehicle runs with much less visible exhaust, and finally the attainment of all of these desirable features is so easy that it is worth the automobilist's while to perfect himself.

In a correctly designed automobile engine the forward position of the reverse lever causes the engine to take steam in the following manner: Suppose the piston to be at the top of its stroke and about to descend under the influence of steam pressure. Steam will enter and force the piston almost across the cylinder before it is cut off, and on the return stroke the cylinder full of steam is rejected to the atmosphere.

It is perfectly evident that, if the piston takes steam clear across the stroke, it rejects the same at practically the same pressure at which it received it, and therefore the only energy which it has received during the process is that given it by the boiler in forcing the steam into the cylinder. The cylinderful of steam that is thrown away at practically admission pressure is capable of doing much useful mechanical work, and it is clearly a waste to allow the steam distribution to occur in this manner. It is not to be inferred from this that it is wrong to design automobile engines that do this. Quite the contrary, for there are times when to the automobilist economy is nothing and great power all-important. An engine taking steam in this way is giving the maximum power of which it is capable, though at ruinous economy, and therefore, although every automobile engine should be arranged so that it can take steam for a large portion of the stroke and thereby give great power in cases of emergency, to continuously operate it in this position is clearly bad practice.

If we were to admit steam to the cylinder for one-quarter of the piston stroke and then cut the same off, the pressure on the piston would not cease, but would continue at a reducing rate, due to the expansive power of the steam, and if the stroke were sufficiently long the pressure would presently fall off to that of the exhaust and the steam would be rejected from the cylinder, having given up to the engine most of the energy which the device was capable of extracting.

This plan of early cut-off and the use of expansion is the principle of all economical piston-driven steam devices. Some steam pumps, for instance, take steam clear across the stroke and have an enormous power, size of cylinder considered; but they use from 140 to 200 pounds of water per horse-power per hour, whereas well designed steam engines may use as low as 18 or even 15 pounds of water per horse-power per hour.

The action of the reverse lever on most steam automobiles as it is receded from the extreme forward position is to shorten the cut-off, and finally to transfer that event to the other side of the stroke, and hence it may be stated as a general principle that it is more economical to control the speed of the vehicle by the use of the reverse lever, using the throttle only for the purpose of starting and stopping. It will be found convenient to set the reverse lever at the speed that it is desired to maintain, and to use the throttle for intermediate control. Just where to set the reverse lever for best economy cannot be laid down as a rule for all automobiles without taking up the valve gear details, and different manufacturers have different ideas, but it can be safely said that if the engine is properly designed, the extreme forward position is not the most economical, but the most powerful.

This method is used by all steam locomotive runners. The engineer starts with the reverse lever in the full forward notch, but having gotten his train well under way, he shortens the cut-off by moving the reverse lever backwards. The steam automobilist in duplicating this performance will note a large saving of water and oil.

Specific cases may require different treatment, and some valve gears are so designed as to render this method of control inadvisable or impossible, but such an arrangement is not desirable.

Electric Vehicles in Mexico.

The accompanying illustration shows one of the electric 'buses operated in the City of Mexico by the Compania Mexicana de Vehiculos Electricos. That city is one of the earliest to have a regular electric 'bus service, and the efficiency with which traffic is handled has called favorable comment in the local press.

A Joint Exhibition in Paris.

There will be an exhibition in the Grand Palais of the Champs Elysees, Jan. 21 to Feb. 10, 1901, under the joint auspices of the Automobile Club of France, the Chambre Syndicale au Cycle et l'Automobile, the Chambre Syndicale de l'Automobile, the Syndicat des Fabricants de Cycles, and the Syndicat Francais de l'Industrie General des Cycles. The show will include automobiles, cycles, materials and accessories, tires, motors, costumes, new inventions, and various exhibits having to do with sporting, touring, aerostation, etc. The committees on organization and patronage include such leading names as Jeantaud, Longuemare, Michelin, Mors, Delaunay-Belleville, Hospitalier, Giffard, Gordon Bennett, Meyan, and Sencier. In view of the striking success of the automobile fetes at Vincennes during the recent Exposition, it is expected that President Loubet and various members of the Ministry will attend the coming show.

AN ELECTRIC BUS IN THE CITY OF MEXICO.

The Automobile Club of Brooklyn held a run on the morning of Dec. 9, from the Clarendon Hotel to Prospect Park and return.

CLUB NEWS AND VIEWS

Club Directory.

Automobile Club of America, Malcolm W. Ford, Secy., 203 Broadway, New York.

Automobile Club of Baltimore, W. W. Donaldson, Secy., 872 Park Ave., Baltimore.

Automobile Club of Bridgeport, F. W. Bolande, Secy., 49 Cannon St., Bridgeport, Conn.

Automobile Club of Brooklyn, C. Benton Dix, Secy., Hotel Clarendon, Brooklyn, N. Y.

Chicago Automobile Club, H. M. Brinckerhoff, Secy., Monadnock Block, Chicago.

Automobile Club of Columbus, C. M. Chittenden, Sec., Broad St., Columbus, O.

Automobile Club of Rochester, Fredk. Sager, Secy., 66 East Ave., Rochester, N. Y.

Buffalo Automobile Club, Ellicott Evans, Secy., Lenox Hotel, Buffalo, N. Y.

Cleveland Automobile Club, L. H. Rogers, Secy., Cleveland, O.

Columbia College Automobile Club, Lewis Iselin, Secy., Col. College, New York.

Long Island Automobile Club, C. W. Spurr, Secy., 980 St. Marks Ave., Brooklyn.

Massachusetts Automobile Club, L. E. Knott, Secy., Ashburton Pl., Boston.

New Jersey Automobile Club, Dr. H. Power, Secy., Upper Montclair, N. J.

North Jersey Automobile Club, E. T. Bell, Jr., Secy., Paterson, N. J.

Philadelphia Automobile Club, Frank C. Lewin, Secy., Hotel Flanders, Phila., Pa.

Pennsylvania Automobile Club, H. J. Johnson, Secy., 138 N. Broad St., Philadelphia.

San Francisco Automobile Club, B. L. Ryder, Secy., San Francisco, Cal.

Worcester Automobile Club, Harry F Knight, Secy. and Treas., Worcester, Mass.

Committees of the Automobile Club of America.

The standing committees of the Automobile Club of America have been appointed as follows:

Contests and Technical—C. J. Field, Chairman, who will appoint four associates.

Laws and Ordinances—George F. Chamberlin, Chairman; James C. Church; one to be appointed by Mr. Chamberlin.

Runs and Tours—Albert C. Bostwick, Chairman; Dr. J. Grant Lyman, J. C. McCoy, George Isham Scott, Harrison K. Bird, W. E. Scarritt, J. Dunbar Wright.

House Committee—Charles P. Doelger, Chairman; Malcolm W. Ford, S. T. Davis, Jr.; J. M. Hill, Samuel H. Valentine.

Library Committee—A. R. Shattuck, Chairman; E. E. Schwarzkopf, Frederick W. Tousey.

Membership Committee—Gen. George Moore Smith, Chairman; Sydney Dillon Ripley, J. M. Ceballos, V. Everit Macy.

Auditing Committee—George W. Young, Chairman; J. Talbot Taylor, Warner M. Van Norden.

Albany Post Road Committee—J. M. Hill, Chairman; Col. John Jacob Astor, Amzi L. Barber, Alexander Fabbri, Ernest G. Fabbri, S. T. Davis, Jr.

Good Roads Committee—A. R. Shattuck, Chairman; Hon. George R. Bidwell.

Foreign Relations Committee—Clarence G. Dinsmore, Chairman; David Wolfe Bishop, J. Dunbar Wright.

Automobile Club of Brooklyn.

At a meeting of the newly-organized Automobile Club of Brooklyn, at their quarters in the Hotel Clarendon, on Dec. 10, the following officers were elected: President, Edw. J. Bergen; Vice-Presidents, R. H. Jones, Dr. W. M. Hutchinson; Secretary, C. B. Dix; Treasurer, C. H. Tangeman; Counsel, J. J. Robinson. The Board of Governors comprises the above, except Mr. Robinson, and also B. F. Tyler, Dr. Clinton B. Parker and F. D. Maltby. The board meets the first Monday of each month.

The following committees have been appointed by the Board of Governors:

Membership: Dr. DeWitt L. Parker, Dr. J. O. Polak, Jos. Gardam.

House: Dr. C. B. Parker, Chairman; J. F. Oltrogge, D. I. Mead, J. I. Bergen, W. M. Follmer.

Tours, Runs and Exhibitions: F. D. Maltby, Chairman; C. H. Tangeman, Dr. DeWitt L. Parker, Th. Heilbron, E. J. Bradbury, Eugene La Grove, Henry Hyatt.

Laws and Ordinances: J. C. Church, E. J. Bergen, J. J. Robinson.

Auditing: C. E. Smith, E. C. Boyce, E. H. Bancker.

Buffalo Automobile Club.

At a recent meeting of the Buffalo Automobile Club it was decided to lease quarters on the ground floor of the Lenox Hotel, these including a large club room, reception room, private dining room and bath. It is hoped that a charging station will soon be provided for in the same connection.

The following officers have been elected for 1901: President, Dr. Truman J. Martin; vice-president, W. C. Cornwell; treasurer, Lee H. Smith; secretary, Ellicott Evans.

The North Jersey Automobile Club (formerly the Essex Co. Automobile Club) has opened a supply station at 81 Broadway, Paterson, N. J., for the benefit of tourists.

The Westchester Automobile Club.

The above organization has recently been formed, one of its objects being to establish supply stations on the roads leading to the Ardsley Casino and other points of rendezvous. Among its members are W. K. Vanderbilt, W. K. Vanderbilt, Jr., General George Moore Smith, Albert C. Bostwick, F. W. Geissenhainer, J. Dunbar Wright, etc.

The club had a run from the Waldorf-Astoria to White Plains on Dec. 1.

Rhode Island Automobile Club.

The Rhode Island Automobile Club has elected the following trustees: J. E. Fletcher and W. G. Titcomb, to serve till 1901; W. R. Weeden and H. F. Lippitt, till 1902; and R. L. Lippitt and Lowell Emerson, till 1903.

The following committees have been appointed: Membership, H. A. Du Villard, W. G. Titcomb, R. L. Lippitt; House, Dr. W. E. Hibbard, Jonathan Chase, John Shepard, Dr. J. A. Chase, C. O. Read; Runs, Contests and Tours, R. L. Lippitt, F. E. Perkins, H. G. Martin; Laws and Ordinances, J R. Bartlett, R. S. Howland, Daniel Case.

A Race in New Jersey.

The North Jersey Automobile Club held a race on Nov. 29 over a ten-mile course from the club house in Paterson to Rochelle Park and return. The race was won by F. R. Reynolds in 31:22, with J. E. Barbour and E. T. Bell, Jr., following only ten seconds apart. The roads were very heavy.

NOTES.

The Automobile Club of Bridgeport has been incorporated.

The Automobile Club of France now numbers 2,400 members, and is constantly growing.

The Automobile Club of Southern California has been incorporated, with headquarters at Los Angeles.

The Automobile Club of America has secured new quarters in the building on the northeast corner of Fifth Ave. and Fifty-eighth St., New York. The club will take possession Feb. 1.

The Automobile Club of America held a successful run from New York to Bridgeport, Conn., on Dec. 15, being paced as far as Central Bridge. The roads were in fine condition, and the club was handsomely entertained by the Automobile Club of Bridgeport at the Algonquin Club.

A French Fuel Consumption Contest.

A most interesting contest was held in November under the auspices of the Auto-Velo, this being a test of fuel consumption over a course of 70 kilom. (43 miles), from Suresnes to Meulan and return. The competitors were started with their tanks filled and sealed, and on their return the quantity of fuel needed to refill the tanks was carefully measured. The speed was restricted to the legal limit of 30 kilom. per hour, those covering the course in less than 2h. 20m. being disqualified. Ninety-five vehicles started and all but five finished. The records of the winning vehicles in each class were as follows:

A.—Vehicles weighing over 2,200 lbs.

Name of maker.	Wgt. lbs.	Consumption.	Time, h.	m.	s.
Delahaye	2,230	*7.	3	0	10
Delahaye	2,260	7.85	2	58	45
Panhard-Levassor	2,460	8.40	2	20	27
Panhard-Levassor	2,400	8.65	2	36	22

*Litres (1 litre = .264 gals.).

Largest consumption, 15 litres.

B.—Vehicles from 1,540 to 2,200 lbs.

G. Richard	1,780	6.40	3	7	15
Mors	1,960	6.75	2	26	34

Largest consumption, 9.05 litres.

C.—Light vehicles from 880 to 1,540 lbs.

Delahaye	1,150	5.00	3	6	27
Clement	940	5.25	2	48	
Dupont	920	5.25	3	6	6
Creanche	1,030	5.35	4	42	50

Largest consumption, 12.30 litres.

D.—Voiturettes from 550 to 880 lbs.

G. Richard	660	3.60	3	6	41
Corre	640	4.20	2	37	12
De Dion-Bouton	825	5.00	2	49	3
Gladiator	670	5.00	3	11	30

Largest consumption, 14 litres. Next largest, 6.77 litres.

E.—Voiturettes under 550 lbs.

De Boisse	470	2.24	3	33	51
Campagne	470	3.70	3	22	53

Largest consumption, 5.9 litres.

F.—Quadricycles carrying two.

De Dion-Bouton	360	1.65	3	16	57
De Dion-Bouton	530	2.24	3	0	20

Largest consumption, 4.11 litres.

In no case did the report of the trial include the rated power of the motor, but this omission may have been intentional. The diversity in the fuel consumption of different machines of similar weight is very marked, even between machines of the same make and class. An interesting feature was the performance of two Gobron-Brillié cars in Class A. One, weighing 2,420 lbs., used alcohol, being the only vehicle using that fluid, and consumed 10 litres. The other, weighing 25 lbs. more, consumed 8.8 litres of gasoline, and made the course in 2:14:50, against 2:40:37 for its companion. As the gasoline machine exceeded the speed limit, it was disqualified, but the record was preserved.

British Motocycle Records Lowered.

On Oct. 31 a new British hour record for motocycles was made by Chas. Jarrot on the Canning Town track. The distance covered was 42 miles 235 yards, nearly three miles better than the previous record; and all records from one mile upwards were beaten at the same time. The machine used was a single-cylinder 8 h. p. De Dion tricycle.

A Delicate Steering Feat.

During the 1,000-mile tour of the Automobile Club of Great Britain, Mr. M. Grahame White, a well-known automobilist, won general admiration by steering a disabled Daimler car, by bearing with his foot on one of the front hubs, a distance of 52 miles, at an average speed of 10 miles an hour. Recently Mr. White distinguished himself again in a similar manner in France, where he piloted a 12 h. p. Panhard belonging to the Count de Bouvence over a difficult route at an average speed of 11½ miles. It was only at the end of the drive that the Count learned the name of his daring "friend in need."

An Anniversary Run in England.

On Nov. 10, the anniversary of the signing of Magna Charta, the Automobile Club of Great Britain held a run from London to Southsea, about 100 vehicles participating. A cup was offered by Mr. Alfred C. Harmsworth for the best appearance at the end of the run, and club diplomas were awarded for non-stop runs. In addition, there was a hill-climbing contest up Hind Head, a three-mile ascent with a rise of 600 feet. This was won by Mark Mayhew in his 16 h. p. Napier, his time being 7:16, or an average speed of 24.77 miles per hour. He was followed a second later by Cecil Edge on a De Dion-Bouton tricycle of 5 h. p. Nearly thirty cars made the run to Southsea without stops necessitated by the machinery.

A Thousand-Mile Non-Stop Run.

Two French machines of the Decauville make were subjected to a unique test on Nov. 21-22, on the 3-lap Crystal Palace Track, London, in an attempt to cover 1,000 miles with no stop whatever, tire repairs excepted. The test was managed by the Decauville Co., and their English agents, the Motor Car Co., and the machines were of 5 and 8 h. p., respectively, both with water-cooled motors.

The smaller machine went through the trial successfully, barring two stops to replace leaky inner tubes, during both of which stops the motor was kept running. Gasoline was taken aboard, drivers changed, etc., simply by slowing down; and once a new inlet valve spring was fitted to one of the two cylinders while the car was kept under way by the other. Near the end, one bearing got dry and was located only after several miles had been run to the sound of its "screeching."

The larger car was brought to an early stop by the freezing of its vaporizer, but subsequently, with the motor bonnet shrouded in a blanket, it was started for a 1,000-kilometre (620 mile) run, which it completed without stoppage. At one time a lamp in the body was upset, setting the thing on fire, but the blaze was smothered in the course of a lap or so. This car made an average speed of 24.93 miles per hour, and the smaller one 20.66 miles from start to finish.

FOREIGN NOTES.

Taxes of from 30 to 50 francs have been imposed on automobiles in Brussels. The new locomotion is popular there, however, and King Leopold has lately purchased two Panhards, of 12 and 20 h. p. respectively.

The new De Dion motor tricycles are equipped with a clutch, so that the motor can be started separately by the pedals, without moving the machine. This renders starting a much easier process than when the tricycle must be pedaled forward to start the motor.

The London Daily Mail has exposed a concerted plan of various county councils to endeavor to secure speed and other legislation which if enacted would seriously cripple the automobile industry. The hostility of the local authorities to motor vehicles, which vents itself in all sorts of vexatious persecution, has become a feature of English automobilism. It is the old story of that stubborn resistance to new things, which has constantly hampered England's industrial growth.

A minor nuisance of automobiling is the fondness of dogs for attacking the horseless vehicles, to the peril of both themselves and the machines. Hardly a race comes off in France but the lives of several of the species are sacrificed to their temerity, and it will be remembered that M. Charron, the winner of the Gordon Bennett race last summer, narrowly escaped a fatal disaster when a few miles from the finish, a dog becoming entangled in the steering gear and causing the machine to leave the road and mount the bank. The Baron Arthur de Rothschild has invented a device for meeting attacks of this nature, which consists of a long landing net, handled by the mecanicien. With this apparatus the belligerent canine may be neatly scooped up, when he is swung for a moment in the air, and then "gently" dropped by the roadside.

It is announced that forty-two of the sixty spaces available have been allotted in the Coliseum, Chicago, for an automobile show to be held there in March next.

The Automobile Stable and Livery in New York.

The rise of the automobile brings with it the public storage and repair "stable" and the automobile livery. New York has not only the livery—two of them—but a flourishing "stable" as well, and two or three stations where private electric vehicles may be charged and their batteries looked after.

The Automobile Storage & Repair Co.'s stable, at 57 West Sixty-sixth street, was opened last year to accommodate the vehicles of residents on the West Side. It is a large room on the ground floor, with an office and waiting room, and it now contains about seventy automobiles, steam, electric, and gasoline. Here the machines are received at the end of their runs, washed and inspected, the batteries charged or tanks filled, and minor repairs attended to. All sizes and degrees, from the motor tricycle to the 'bus and the stately Panhard racer, may be seen here regularly or occasionally, and the student of automobilism has here the best of opportunities to see the motor vehicle in its guise of every day.

A branch charging station has just been added by the above company at Clement Hotel, 126th street., Riverside, and another company, the Storage Battery Supply Co., or 239 East Twenty-seventh street, has added the charging and repairing of electric vehicles to its business.

ONE OF ITS LATEST VEHICLES.—N. Y. VEHICLE & TRANSPORTATION CO.

Both of the public liveries operate electric vehicles. The more recent of these is the General Carriage Co., whose charging station is temporarily located at 63 West Forty-third street. This company, which operates both hansoms and carriages, has about fifty vehicles all told. Of these some twenty-five are hansoms, and the rest are broughams and victorias, with three or four electric 'buses and the same number of brakes.

No attempt is here made to change the battery trays in its vehicles except in emergencies, but they are charged in situ from rheostats on the walls. The other public livery, however, that of the New York Electric Vehicle & Transportation Co., at the corner of Broadway and Fifty-second street, has a plant very completely organized for quickly changing the battery trays of its hansoms and broughams, performing all the operations thus involved by power. This latter provision is rendered economically necessary by reason of the large business done by the company and the necessity of having the vehicles idle as little as possible of the time.

The Selden Patent Suit.

On Nov. 9 a decision was handed down by Judge Coxe, of the U. S. Circuit Court for the Southern District of New York, overruling a demurrer filed by the defendants, the Winton Motor Carriage Co., in the Selden patent case. In his decision the Judge says:

"The bill, in the usual form, is based upon letters patent No. 549,160, granted November 5, 1895, to George B. Selden for a road vehicle, the motor being a liquid hydrocarbon gas-engine of the compression type. The application was filed May 8, 1879.

"The demurrer, though divided under five separate heads, is based upon the broad proposition that the patent, on its face, is void for lack of patentability.

"Stated generally, the argument for the defendants is as follows: The specification concedes that all of the elements of the combinations of the claims were old; that steam engines were employed to propel road wagons, liquid fuel being used to generate steam; that gas engines were old and their use, as well as that of other motors, had been proposed for tram cars and similar vehicles. This being the admitted state of the art it is argued that it did not require an exercise of inventive faculty to substitute a gas-engine for a steam-engine in a well-known self-propelling vehicle.

"It is insisted, further, that the claims do not cover combinations but are for aggregations merely.

"The law is very plain. A patent must not be held invalid upon demurrer unless its invalidity so clearly appears that no testimony can change the legal aspect of the case. If doubt exists the complainant is entitled to its benefit; if the faults pointed out by the defendant may, by any chance, be cured by proof; if, in short, there be a possibility that the complainant may succeed, the demurrer should be overruled."

Continuing, the Judge inclines to the belief that the Selden patent does show invention, on the ground that invention would be required to adapt the gasoline engine and the vehicle to each other in their new relation. It thus remains for the defendants to produce positive proof that such invention was lacking and that the machine as set forth in the patent was impracticable or inoperative

An Automobile Depot in Reading.

J. G. Xander, who has been in the bicycle business in Reading, Pa., for some years past, has opened a sundry supply house in that city, where he will deal in automobile parts and accessories of all sorts, giving particular attention to orders from those who wish to build their own vehicles. He will also act as manufacturers' agent.

The Washington Show.

The automobile show in Washington, D. C., Dec. 10th to 15th, was well attended and was pronounced a success. Convention Hall, where it took place, was handsomely decorated, and an eight-lap track running around the exhibition spaces gave opportunity for testing the machines. The most attractive event of the week was a floral parade Tuesday night, which was won by Martin Kastle, the Washington publisher, driving a Locomobile.

Automobile Shows in Philadelphia.

Two shows are scheduled to be held in Philadelphia this month and next. The first, under the auspices of the Philadelphia Cycle Board of Trade, will take place in the Third Regiment Armory, Jan. 26 to Feb. 2. There will be a track around the exhibits, and some contests are proposed as a feature of the show. The other show will be under the joint auspices of the Automobile Club of Philadelphia and the Pennsylvania Automobile Club, and will be held in the Second Regiment Armory, Feb. 4 to 9, and these clubs will supervise the track contests, etc.

American Bicycle Co. Acquires the Sperry Patents.

The American Bicycle Co. has acquired from the Cleveland Machine Screw Co. all of that company's stock of electric vehicles and patents, together with the entire series of storage battery patents issued to Elmer A. Sperry. These latter cover a unique form of battery, for which remarkable results are claimed. It is said that weight for weight, the new Sperry battery has more than three times the capacity of the ordinary kinds, and that it can be charged more than twice as rapidly without damage. By reason of the battery's light specific weight, it is claimed that a carriage can carry battery power enough to propel it 100 miles over average roads. Mr. Sperry, who is a well-known electrician, has been at work on this battery for several years past.

New Exchange and Storage Establishment.

The Automobile Exchange & Storage Co., recently organized in New York to do a general storage agency and repair business in automobiles, has erected a new building on West Thirty-eighth St., near Broadway, with ample room and the most complete facilities for all work of this kind. The new quarters have just been completed, and are now open for business.

Officers of the Manufacturers' Association.

The National Association of Automobile Manufacturers has perfected its organization by the election of the following officers: S. T. Davis, Jr., President; John H. Flagler, First Vice-President; J. Wesley Allison, Second Vice-President; C. J. Field, Third Vice-President; D. S. Walker, Treasurer; E. P. Wells, Secretary. A Board of Directors has also been chosen, as follows: S. T. Davis, Jr., F. T. Bradbury, A. S. Winslow, W. H. Duryea, and a representative of the Daimler Mfg. Co., one year; J. M. Hill, A. L. Riker, W. C. Baker, R. A. Ballentine and J. H. Flagler, two years; John Brisben Walker, C. J. Field, E. P. Wells, J. Wesley Allison and Alexander Winton, three years.

A Hot Water Foot Warmer.

Doubtless many people have wondered why the surplus heat given off by a gasoline, engine, in the jacket water and exhaust gases, should not be used for heating purposes in cold weather. Something of this sort has been done by W. E. Mack & Co., the Chicago agents of the Haynes-Apperson Co., in a vehicle purchased by a physician of that city. Three-quarter inch pipes, connected with the water tanks, are run so as to partially cover the floor of the carriage, and it is stated that within ten minutes after the engine has been started these are warm enough to keep the passengers feet warm in the coldest weather.

Correspondence.

Space will be given on this page to letters concerning the Automobile, its operation or construction, to accounts of tours or runs, routes of travel, good roads, etc. When requested by correspondents their names will not be published, but must always be given in the communication to the Editor.

Acetylene as a Fuel.

Editor THE AUTOMOBILE:

Will you please tell me why acetylene gas is not more used for hydrocarbon motors? J. W. Farnoff.

Buffalo, N. Y., Dec. 8.

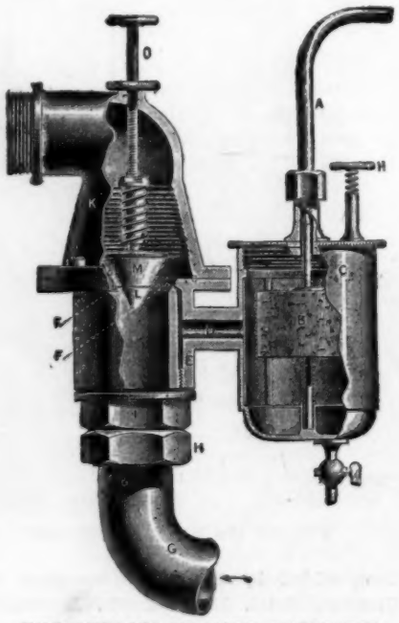
[The leading reason why more has not been done with acetylene is that, for equal theoretical fuel values, it costs about three times as much as gasoline. Even were gasoline three times as high in price as it is, no way has yet been found to utilize acetylene practically, on account of the extreme rapidity of its combustion and the consequent great loss of heat to the water jacket at the beginning of the stroke. Undoubtedly some way could be found of overcoming this latter difficulty, but there is at present little incentive to effort in this direction.—Ed.]

The Georges Richard Vaporizer.

The illustration shows a vaporizer recently patented by the well-known French house of Georges Richard, and containing one or two novel features. The gasoline enters the cup C by the tube A, and is kept at a constant level by the float B and attached needle valve. Through D it passes into the annular space around the vaporizer proper, at the top of which space are three minute orifices, FF. Fresh air, warmed by passing over the exhaust chamber or otherwise, is drawn in at G by the piston's suction, and is deflected by the cone LM in a sharp stream past the orifices F, drawing the gasoline with it in a fine spray. Impinging on the grooved inner wall of K, the spray is arrested and converted into vapor, which, mingling with the air, passes to the engine.

The especial feature of this vaporizer is that the base M of the cone is made movable on its stem, being held normally down by a compression spring. By the rush of the air this cone is slightly lifted, thus giving a large passage for the air past the orifices F, and the amount of this lift is according to the speed of the motor and consequent velocity of the air current. The reason for this arrangement is stated to be that, where the width of the air passage is constant, the vaporizer gives a correct mixture only at one speed of the motor, the issuance from the gasoline orifices diminishing as the air current is less intense. For this reason any sudden increase in road resistance, by slowing down the motor, causes the mixture to become weaker just when the full power is needed. By carrying cone M on a spring the air passage is automatically reduced as the motor speed falls off, and the gasoline is sucked with the same intensity as before. The normal height of the cone can be adjusted by the threaded stem O.

[In considering devices of this sort, it should not be forgotten that a strong flow of air means that a cylinderful is passing through the vaporizer in a very short space of time, and the flow of gasoline must necessarily be rapid to supply the needed quantity in the brief interval allotted. Per contra, a weak flow of air, due to low motor speed, means that the gasoline flow must be weak in like degree, else the mixture will be too rich. That is, if the gasoline orifices are not too high above the level in the cup (necessitating a certain initial suction before the gasoline sprays at all), the ordinary vaporizer with fixed air passage is—within reasonable limits—self-regulating, and supplies gasoline fast or slowly, according as the piston draws air fast or slowly. Nevertheless, it appears to be true that, with a fixed air passage, the gasoline spray falls off more rapidly than the air when the piston speed diminishes, and some makers counteract this by setting the gasoline orifices below the normal level in the cup. This is open to the objection that when the motor stops the mixing chamber becomes flooded, unless the gasoline is at once shut off by a supplementary cock; and it would appear that, with the right sort of a spring to control the rise of the cone, the device described should be a material improvement on previous methods.—H. L. T.]



THE GEORGES RICHARD VAPORIZER.

Mr. L. F. N. Baldwin, inventor of the Baldwin steam carriage, has severed his connection with the Baldwin Automobile Co., of Connellsville, Pa., and intends to form a company in the East to manufacture delivery wagons.

The Banker Motor Bicycle.

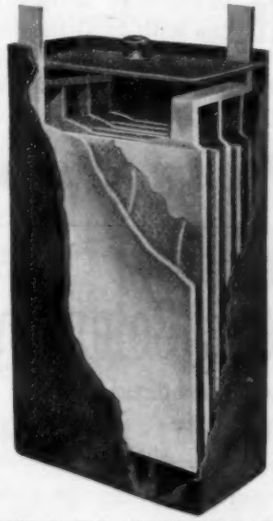
The illustration shows a motor bicycle made by A. C. Banker, Morgan and Pratt Sts., Chicago. Mr. Banker states that it has been in constant use for the past two months, and has given entire satisfaction. Its total weight is about 60 lbs., of which the motor accounts for 19. The latter measures only 3¾ inches in total width, so that it is not in the way of the cranks. It is not

THE BANKER MOTOR BICYCLE.

Mr. Banker's intention at present to supply complete outfits, but to sell the motors alone to other makers.

The Gould Automobile Cell.

The accompanying cut shows the style of battery cell made by the Gould Storage Battery Co., New York, for automobiles. It shows the clearance given at the bottom of the cell, the form



THE GOULD AUTOMOBILE CELL.

of separator used, and the method of connecting the plates to the cross bars. These plates are "formed" electrically, and are stated to have a much longer life than pasted plates.

EXHIBITION NOTES.

The automobile show to be held in Philadelphia, Feb. 4th to 9th, under the auspices of the Pennsylvania and Philadelphia Automobile Clubs, its promoters announce, is assured of success. Out of 86 spaces it is stated that only about 6 spaces are left. The list of firms that has already taken space includes most of the leading manufacturers.

The following firms exhibited at the Washington automobile show, Dec. 10 to 15: Riker Motor Vehicle Co., Woods Motor Vehicle Co., Locomobile Co. of America, Mobile Co. of America, American Bicycle Co., Electric Vehicle Co., De Dion-Bouton Motorette Co., Overman Automobile Co., Knox Automobile Co., N. Y. Belting & Packing Co., Penna. Horseless Carriage Co., and Rose Mfg. Co.

BUSINESS NEWS.

Two Washington hotels, the Cochran and the Arlington, have been using hotel buses from the Electric Vehicle Co. for the past three months, and in letters to the makers they express themselves as well satisfied with the results thus far.

The Storey Motor & Tool Co., formerly of Trenton, N. J., has changed its name to the Storey General Electric Co., and has removed its manufactory to Harrison, N. J. The company will manufacture motors, dynamos, tools, etc.

The St. Louis Automobile & Supply Co., St. Louis, Mo., has just completed a gasoline trap to go to Sierra Hermosa, Mexico. The machinery equipment is the "Outfit No. 2," of the above company, and the vehicle will carry four passengers and baggage.

The Winton Motor Carriage Co., Cleveland, has leased Proctor's Palm Garden, at 150-152 E. 58th St., New York, and is fitting it up as a salesroom for its eastern department. Facilities for the storage and repair of vehicles will also be provided. When finished the establishment will be one of the most complete of its kind. Mr. Percy Owen will be in charge.

The Herald Square Automobile Exchange is to be opened Jan. 1st at 147 to 151 West 35th St., near Broadway. Mr. W. T. Ames is the proprietor, and Mr. Herbert F. Blake, manager. Storage will be provided for electric, gasoline, and steam vehicles, and repairs made to vehicles of all makes. Automobiles will be bought and sold, and parts carried constantly in stock.

The Jos. Dixon Crucible Co. states for the benefit of automobilists using dry graphite for lubrication that it can be applied with an ordinary squirt can. Only a clean and dry can should be used, and if the graphite is of the coarse flake variety the nozzle should be enlarged accordingly.

The Remington Automobile and Motor Co., writing under date of Dec. 14, states that the streets of Ilion, N. Y., where its factory is located, were at that time covered with 18 inches of snow and that in spite of that fact their experimental carriages, weighing 1,200 lbs., and driven by 4 h. p. motors, were successfully operated over those streets, there being no special track whereon to demonstrate them.

The Sprague Electric Co. has recently been obliged by its growing business to add largely to the floor space of its New York office, the latter now occupying three floors of the factory. The New York factory is devoted entirely to the manufacture of interior conduits and wiring supplies, while the light and power apparatus are manufactured at the larger plant at Bloomfield, N. J. The company has recently taken up the manufacture of motors and appliances for electric vehicles.

Clinton E. Woods, Chicago, late of the Woods Motor Vehicle Co., is now building electric vehicles after models of his own, and has issued an artistic pamphlet and sheets giving front and side views of his runabout, victoria stanhope, brougham cab, delivery wagon, etc. These vehicles are especially distinguished by their departure from horse vehicle forms, being, as their designer declares, automobiles and not "horseless carriages." Some of their leading features are the suppression of the reach, special arrangements of the spring being substituted, the use of a box in front of the dash, suggesting the motor bonnet of French gasoline machines, a narrow tread for the front wheels, and a single controller handle for all the speeds and also for the electrical and mechanical braking systems.

The Waltham Mfg. Co. has sent out the following list, published by the Aster Motor Co., for whom it is the American agent, of events won in France, by the Aster Motor during the past year:

At the Exposition contests, Aug. 13 to 17, a gold medal was awarded to three Gladiator voiturettes with Aster motors for economy and manageability. The distance covered was 800 kilom. (500 miles); average speed 25 kilom. (15.5 miles) per hour; mean consumption 46 litres (11.5 gal.). In the motocycle class the gold medal was awarded to a Rochet tricycle and quadricycle, both with Aster motors. The former's consumption was 20 litres and the latter's, with two persons, was 29 litres.

In the Chanteloup hill-climbing contest, up a slope 1,800 metres (1,965 yards) long and stated to average 10 per cent. in grade, first prizes were won by voiturettes weighing above and below 250 kg. (550 lbs.), their respective times being 4:08 and 5:56. In the Gaillon hill-climbing contest the Aster motor was fitted to the winning voiturettes of both classes; and at Vincennes a voiturette and a quadricycle with Aster motors won the events in their respective classes.

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Orient Motocycles
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Aster Motors

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NEW PUBLICATIONS.

A new edition of the "Gas Engine Handbook," by E. W. Roberts, is just off the press, the first having been exhausted within six months. The second edition has been carefully revised, and enlarged by an appendix on two cycle engines, with tables of dimensions for designing the latter. This is the only American treatise which contains practical formulas for gas engine design, and its popularity is an index of its usefulness. The second edition is bound only in leather. Price, $1.50. Published by the Gas Engine Publishing Co., Cincinnati, O.

Our esteemed contemporary "Power," has undertaken to publish four times a year a periodical devoted to some one engineering subject, which pamphlet will be known as the "Power Quarterly." The first issue of the quarterly is before us, treating of gas engines. It is a veritable text-book on modern stationary gas and oil engines, both American and foreign. A large number of foreign types are illustrated with many careful particulars of the construction; and in a general treatise on gas engine design are given many useful tables and formulae of the heat cycle and power developed. The pamphlet, which is 8 × 11 inches, has 66 pages of reading matter. Its price is 25 cents, and it may be obtained of the Power Pub. Co., World Bldg., New York.

NEW CATALOGUES.

The Automobile Co. of America, New York, describes its standard "Gasmobile" phaeton in an artistic pamphlet.

The Steam Vehicle Co. of America, New York, has issued a handsome pamphlet describing the "Reading" carriage.

The Locomobile Co. of America, New York, has issued a finely gotten up catalogue, with many artistic illustrations.

The Winton Motor Carriage Co., Cleveland, O., has published a neat pamphlet showing the improved Winton, and also views of the factory.

Pettingill & Co., the advertising agents, 120 Broadway, New York, publish a booklet, "The Science of Advertising," which they will send on request.

The American Bicycle Co., New York, has issued three new catalogues, describing respectively its Waverley electric vehicles and Rambler and Trimoto gasoline machines.

New catalogues come from the International Motor Carriage Co., Stamford, Conn., the Baker Motor Vehicle Co., Cleveland, O., and the Skene Automobile Co., Springfield, Mass.

Patents.

List of Automobile patents granted during month of December.

662,475—Steering and brake device for automobile carriages. Issued to A. Strickland.
662,496—Carbureter. Issued to J. C. Peden.
662,514—Carbureter. Issued to R. Wunsche.
662,455—Speed controlling mechanism. Issued to S. Messerer.
662,686—Rubber tire setter. Issued to S. W. Collins.
662,640—Rubber tire setter. Issued to A. W. Grant.
662,649 to 662,651—Rubber tire setter. Issued to A. S. Krotz.
622,641, 662,642—Device for equipping vehicle wheels with rubber tires. Issued to A. W. Grant.
662,400, 662,401—Automobile vehicle gearing. Issued to L. H. Dyer.
662,902—Motor vehicle. Issued to H. L. Arnold.
663,028—Self-propelling vehicle. Issued to A. Herschmann.
663,898—Device for securing rubber tires on vehicle wheels. Issued to W. Holmes.
664,018—Vehicle motor. Issued to J. W. Eisenhuth.
664,208—Motor vehicle. Issued to H. B. Berendsen.
664,292—Vehicle motor. Issued to W. Riddell.
664,160—Motor-driven vehicle. Issued to P. C. Leidich.

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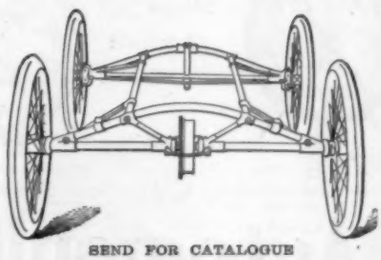

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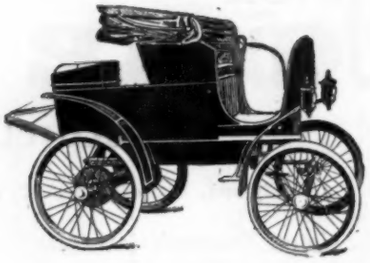

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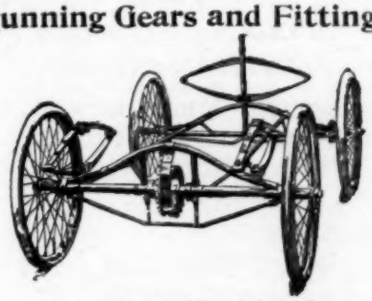

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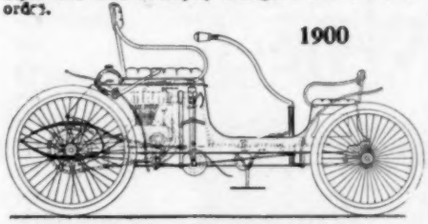

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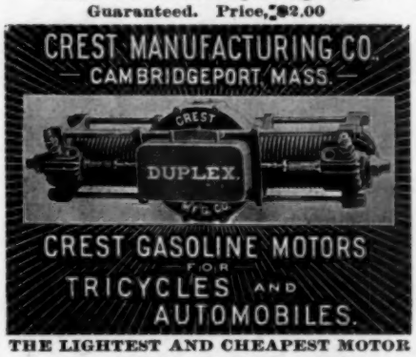

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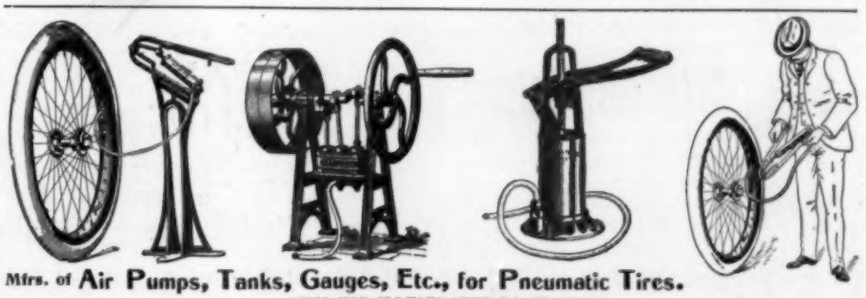

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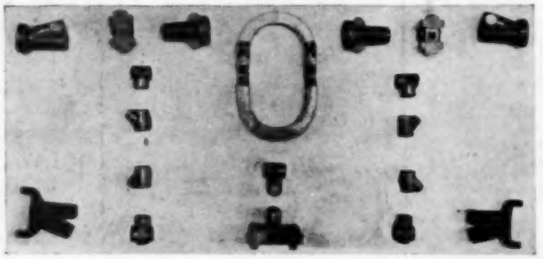

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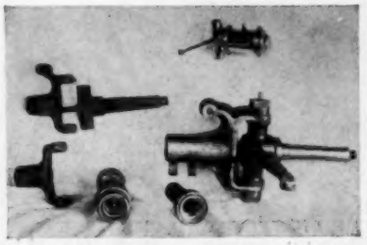

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